not deterrent to females in the red-egg guild and have failed to support the existence of an oviposition-deterrent pheromone. This "natural experiment" supports these conclusions. The greatly increased incidence of multiple oviposition suggests that when host density is reduced by 3–4 orders of magnitude while population density is normal, the *entire stand* of hosts may demonstrate "edge effect"—at least early in the flight, when most eggs are green. Theoretically, as the flight proceeds, the presence of more red eggs should deter multiple ovipositions and perhaps encourage female dispersal. Unfortunately, it was not practical to test this prediction, given the rate of turnover of inflorescences and the rapid maturation of the many *B. nigra* at the Suisun site. The ability of "edge effect" to dominate the pattern of egg dispersion in this unusual situation, however, does tend to confirm that "edge effect" is a statistical consequence of female behavior; it does not clarify the evolutionary origin of that behavior.

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EPIBLEMA LUCTUOSANA A. BLANCHARD, A HOMONYM, IS CHANGED TO ***EPIBLEMA LUCTUOSISSIMA*, NEW NAME**

From Dr. Leif Aarvick (Tårnveien 6, N-1430 Ås, Norway), I received the following information, for which I thank him very much: "Blanchard describes a species which he calls *Epiblema luctuosana*. Unfortunately there is another *Epiblema luctuosana* in Europe (*E. luctuosana* Duponchel, which is a synonym of *E. scutulana* Den. & Schiff). Thus *luctuosana* A. Blanchard is a homonym."

I propose to change the name of the species I described as *E. luctuosana* (1979, J. Lepid. Soc. 33(3):184) to *Epiblema luctuosissima* A. Blanchard.

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SCHIZURA RUSTICA (SCHAUS), A NOTODONTID MOTH DEFOLIATING *HERRANIA* AND *THEOBROMA* SPECIES (STERCULIACEAE) IN COSTA RICA

Herein, I report for the first time the association of the "medium-sized" (approx. 37 mm spread wingspan), dull brown and mottled gray notodontid moth *Schizura rustica* (Schaus), with *Herrania albiflora* Goudot (Sterculiaceae) as a larval food plant at one locality in Costa Rica and the acceptability of the closely related *Theobroma cacao* L. (also Sterculiaceae) as an alternate food plant. My report includes observations on the role of this moth as a serious defoliator of *H. albiflora* as well as offering some preliminary autecological and natural history notes on the life cycle and larval feeding behavior. Although much information has accumulated over the years on the insect herbivores associated with *T. cacao* throughout the tropical regions of the world (e.g., Entwistle, P. F., 1972, Pests of Cocoa, Longman, London; Saunders, 1979, Plagas Insectiles De America Central, Turrialba, Costa Rica: CATIE). Given the very close evolutionary affinities within the Sterculiaceae, particularly for *Theobroma* and *Herrania* (Cuatrecasas, 1964, Contrib. U.S. Nat. Mus. 35:379–614), it would not be unexpected to discover in nature that herbivorous insects associated with one or the other genus successfully feed on the other genus as well. After all, there is at least one documented example of a genus of notodontid moth successfully exploiting both bombacaceous and sterculiaceous larval food plants (Young, J. Lepid. Soc. 37: 182–186), and these two Neotropical tree families are very closely related as well (Cronquist, 1981, An Integrated System of Flowering Plants, Columbia Univ. Press, New York).

On 26 February 1983, I discovered two clusters of caterpillars on a "sapling" of *H. albiflora* (about 1.5 m tall and D.B.H. = 2.0 cm) planted along with a second individual of this species in a *Theobroma* and *Herrania* "garden" (n = approx. 30 trees for total of 5 species) at "Finca Experimental La Lola," near Siquirres (10°06'N, 83°30'W), Limon Province. The locality is within lowland tropical rain forest characteristic of the Atlantic watershed of Costa Rica. The locality experiences a short and irregular dry season between December and March each year, although there are seldom days with no rainfall at all.

When discovered one group contained 15 larvae all aggregated on the ventral side of two adjacent leaflets, and the second group had 10 larvae on a separate leaf. All larvae appeared to be 21–26 mm in body length, and based upon subsequent rearing data, were probably third or fourth instars. An eventual determination of the species resulted from rearing a sample consisting of one of the two groups, the second group being left undisturbed on the food plant. Once collected and confined to a large clear-plastic bag kept tightly shut, the larvae were transferred to *T. cacao* leaves, in order to determine acceptability of this species for successful development. The second group, left on the food plant, served as a control on this study. What initially led to the discovery of the larvae was the fact that the treelet was heavily defoliated, with more than half of the large, stellate-type leaves either completely missing (but not fallen off) or with only midribs remaining (Fig. 1).

Caterpillars remain aggregated on leaves of both *H. albiflora* and *T. cacao*, although groups fragment into smaller clusters in the fifth instar (Fig. 1). Characteristically, individual caterpillars feed from the already eaten edge of leaves and also rest in these positions when not feeding (Fig. 1). The leaves of *Herrania* are usually blotched in shades of light green and brown, a color combination that is matched by the mottled colors of the caterpillars (Fig. 1). Caterpillars feed and rest from loose webbings of silk spun over the leaves and lengthy petioles of *Herrania* leaves.

A single mature leaf of *H. albiflora* consists of usually five leaflets, arranged in a stellate fashion. The "crown" of the treelet consists of a whorl of leaves in the absence of branches, and the very long petioles give the appearance of branches (Fig. 1). At the time of discovery, the treelet had a total of nine leaves, of which two were completely defoliated and the remaining ones with one to four leaflets missing on each (although five of the nine each had three leaflets missing). Thus the defoliation of the treelet by *S. rustica* was very advanced by this time. Absent were any new flushes of young leaves; no flowers and fruits were present. By 12 March (two weeks after initial discovery) only one of the original aggregate of ten caterpillars was left, and this individual was 45 mm long. Based upon the simultaneous rearing on *T. cacao*, this caterpillar (Fig. 1) was judged to be in the final instar. Presumably the others had matured and left the food plant for pupation by this time. The adjacent (about 3 m away) *H. albiflora* had no caterpillars, nor did it have any signs of the defoliation characteristic of this notodontid. The second tree, however, was in advanced stages of defoliation by an unidentified species of leaf-cutter ant, *Atta* sp. (Hymenoptera: Formicidae). Caterpillars kept on *T. cacao* thrived, many of these eventually pupating by 23 March while the sample was being hand-carried on an aircraft between Costa Rica and Nicaragua. Pupae are chestnut-brown and range in body length from 18 to 20 mm. They eclose in 12–14 days, although the length of the pupal stage may vary greatly with temperature and other

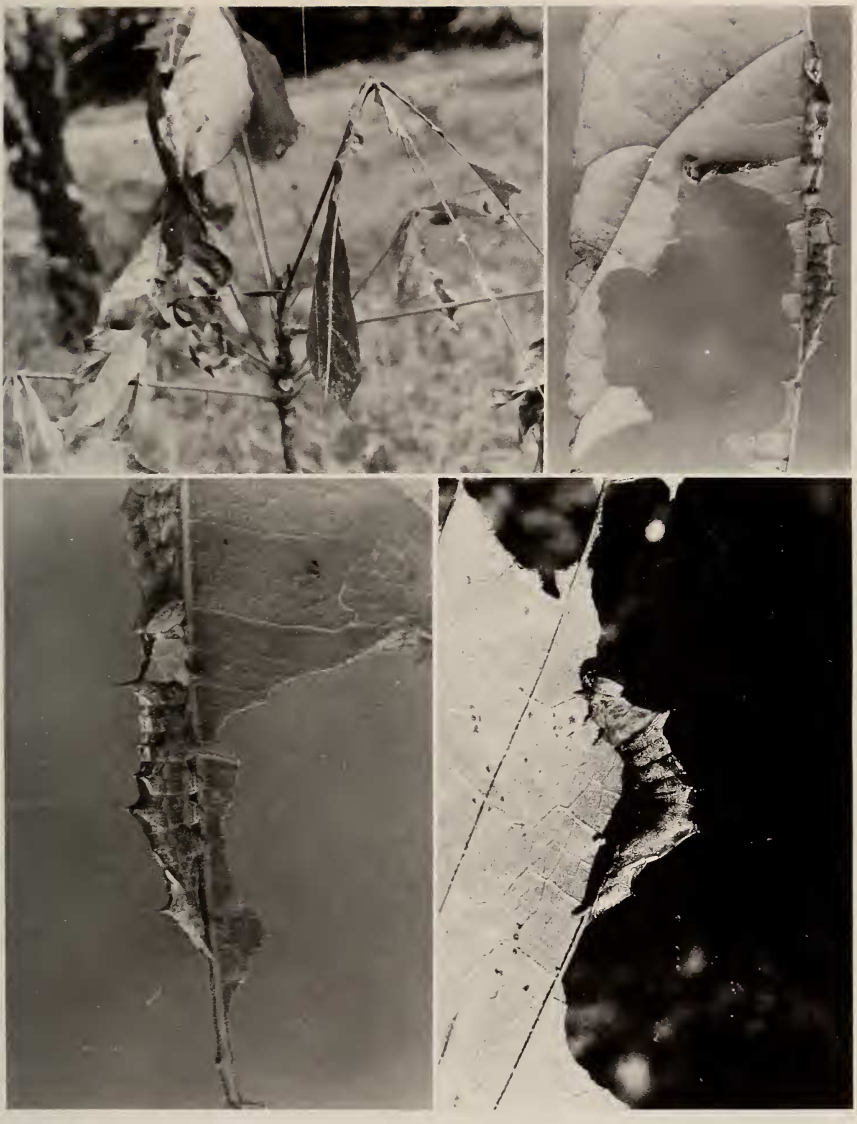

FIG. 1. Caterpillar stage of *Schizura rustica* and associated defoliation activity. Beginning in upper left and clockwise: defoliated *Herrania albiflora*; three fourth instar caterpillars perched on partly devoured mature leaf; fifth instar caterpillar feeding and resting on partly devoured mature leaf (bottom two photographs).

factors associated with husbandry. All adults eventually reared had been fed *T. cacao* following the time of the discovery. On *H. albiflora* in nature caterpillars were seen feeding during daylight hours, with intermittent periods of non-feeding. As typical for various notodontids, including temperate-zone *Schizura* (e.g., Packard, 1893, J. New York

Entomol. Soc. 1:22–78; Forbes, 1948, Mem. 274, Cornell Univ. Agricult. Expt. Sta.), the caterpillars of *S. rustica* are exceedingly cryptic in coloration and in the habit of positioning themselves along the damaged edge of a leaf on which they are feeding.

What follows here is a general macro-description of the final instar caterpillar. Head capsule 4.5 mm high by 4.0 mm at widest lateral area; dull light brown background with heavy speckling of tiny dark brown spots laterally. Frontally with double band of vertical dark brown lines angling towards medial line about ⅔ down head capsule. Three pairs of frontal-to-lateral black setae about ½ down head capsule and a series of three pairs of clustered setae at base of head capsule in lateral areas. Double dark brown bands of frontal area forming a rough hourglass pattern when viewed frontally. Mandibles glossy brown and entire head capsule thrust forward basally. Light brown areas of head capsule speckled with very tiny brownish flecks, much lighter than those of dark brown areas. First thoracic segment forms a conspicuous "neck" ring with vivid yellow spot dorsomedially bordered laterally in very dark brown, almost black, diffuse bands. These bands give way more laterally to light brown. The dark brown bands bordering yellow spot each contain a small cream-colored spot. Below spiracle the segment is expanded posteriorly into wedge-shaped yellow flap. This segment with five pairs of black setae: one pair arising from dorsal dark brown bands; two pairs in lateral light brown area; two pairs arising from dorsal edge of spiracles. Legs light brown. Second and third thoracic segments light green with a prominent dorsomedial stripe that tapers near the end of the abdomen. This stripe is really a composite of a central thick yellow band bordered laterally with a mottled gray and brown area which is edged in a thin dark line of brown on either side. Green areas of these and other segments bearing tiny flecks of purple. Second thoracic segment with five setae when viewed laterally. Third segment begins a conspicuous rise in the dorsal area, forming a prominence that fuses with similar configuration of first abdominal segment. Spiracles absent on second and third thoracic segments. Legs on both segments also light brown. All abdominal segments various shades of brown. First abdominal segment light brown and mottled with a lacework of small dark brown lines; dorsally with a medial prominent biforked chitonous glossy peak. This prominence is reddish brown with one stout black seta oriented upwards on each. Spiracular opening at the anterior border of this segment; ventrally all abdominal segments light green; two pairs of black setae readily visible laterally on first abdominal segment. The brownish lacework of abdominal segments 2–4 form a "saddle-like" configuration laterally; spiracles of these segments more centrally located on each side. Prolegs present on abdominal segments 3, 4, 5, and 6, and this entire region ventrally appears arched up; prolegs orange with reddish streaks. Three pairs of black setae on most abdominal segments, and most of these often arising from reddish bulbous basal structures. Abdominal background color becomes more blackish gray beginning with the third abdominal segment, developing into a broad dorsal band on the following three segments. The fifth abdominal segment bears a smaller dorsomedial prominence and continues on segments 5 and 6, forming a second "peak" along the body axis. Dorsally the posterior half of the sixth segment is white, branching out into two bands on the seventh. The eighth segment with a very small dorsal prominence, and all three prominences biforked (as described above for the first "peak"). Abdominal segment 8 with a lacework of dark brown lines as seen in first two abdominal segments, but now more reticulate over a light, reddish brown background. Spiracles ending on the eighth segment. The white dorsal area of the seventh segment, which branches laterally, abruptly ends with the eighth segment, and the dorsal area is colored with a blackish gray medial band again. This band continues on the ninth and tapers into the anal clasper. The tenth segment is orange-brown and bears two pairs of black setae laterally, while the ninth segment has three pairs. Anal clasper orange with reddish terminal area. The caterpillar grows to about 45 mm prior to pupation. The overall appearance of the caterpillar, and its habit of resting on devoured edges of leaves (Fig. 1), suggest a general strategy of crypsis, a trait presumably shared with earlier instars.

Although some temperate-zone notodontids feed almost exclusively on young, soft tissue leaves of the larval food plants, others selectively feed on mature leaves (e.g., McFarland, 1979, J. Lepid. Soc. 33: Supplement). Aggregated feeding habits in the caterpillars of some Lepidoptera, which often result in severe defoliation, are considered to be adaptations to food plant resources having very patchy distributions and therefore present in very limited supply (e.g., Tsubaki & Shiotsu, 1982, Oecologia 55:12–20; Fitzgerald & Peterson, 1983, Anim. Behav. 31:417–423). At least one temperate-zone species of *Schizura* is polyphagous (Ferguson, 1975, U.S.D.A. Tech. Bull. No. 1521) and the possibility of such a habit being shared with *S. rustica* in Costa Rica cannot be ruled out. Both monophagous and polyphagous notodontids are known from the Neotropical Region (Seitz, 1907, Macrolepidoptera of the World, Stuttgart, A. Kernan). And, aside from the recent report of the notodontid *Lirimiris meridionalis* (Schaus), there are no other published accounts of Neotropical notodontids being associated with Sterculiaceae, and the present reports add a second genus and species to our knowledge of such associations. Given the close evolutionary affinities of *Theobroma* and *Herrania* (Cuatrecasas, op. cit.), the observed interchangeability of leaves from both trees to later instars of *S. rustica* is not a surprising or unexpected finding. Yet, in nature, other factors associated with the trees may select for egg-placement by this notodontid to be primarily a response to *Herrania*, a genus whose member species have leaf configurations and general tree profiles quite different from various *Theobroma*, including *T. cacao*. Noteworthy in this context is the fact that *S. rustica* was found only on *H. albiflora*, in spite of the fact that a handful of *Herrania* trees was surrounded by thousands of *T. cacao* ("cocoa") trees in a plantation setting.

This research is a by-product of a research grant from The American Cocoa Research Institute. I thank Dr. Gustavo Enriquez and don Alfredo Paredes for local assistance at La Lola. The moth was identified by Dr. R. W. Poole of the U.S.D.A. Systematic Entomology Laboratory, and with the cooperation of Dr. Lloyd Knutson.

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FOOD-PLANTS OF THE PIERIDAE

After studying the correspondence between Messrs. Philip James DeVries and Allen M. Young (1982, J. Lepid. Soc. 36(3):299–232), it occurs to me that a general look at the food-plant preferences of the Pieridae, taken region by region, may be of interest.

AFRICA

Pseudopontiinae—No information.

Coliadini

Catopsilia—Cassia (Caesalpiniaceae), *Sesbania* (Papilionaceae), a somewhat dubious record of *Gossypium* (Malvaceae).

Colias—Cassia (Caesalpiniaceae), *Medicago, Phaseolus, Sesbania* (Papilionaceae), *Oxalis* (Oxalidaceae), a somewhat doubtful record of *Ricinus* (Euphorbiaceae).

Eurema—Cassia (Caesalpiniaceae), *Hypericum* (Hypericaceae), *Acacia, Albizzia, Entada, Parkia, Dichrostachys* (Mimosaceae), *Aeschynome, Lespedeza, Sesbania* (Papilionaceae).

Euchloini

Pinacopteryx—Boscia, Cadaba, Capparis, Maerua (Capparidaceae).

Euchloe—Barbarea, Iberis, Sisymbrium, etc. (Cruciferae).

Pierinae

Nepheronia—Ritcheia (Capparidaceae), *Hippocratea* (Hippocrataceae), *Cassiporrea* (Rhizophoraceae), *Azima, Salvadora* (Salvadoraceae).